

# **NASA Public Web Site Integration Implementation Plan**

**Submitted to**

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# NASA Public Web Site Integration Implementation Plan

## *I. Overview*

With the transformation of NASA and its need to communicate to the broadest possible audience -- as well as "to inspire the next generation of explorers" -- it is essential that all of NASA's online content be up-to-date, consistent and engaging. This requirement holds true regardless of whether a piece of content originates within a project, at a NASA center or in the Office of Public Affairs at Headquarters.

To that end, in the summer of 2002, the NASA Administrator directed the creation of the NASA Web Portal. The requirements for the Portal and its operation were:

- Create an attractive interface that would engage general audiences, especially young students.
- Tell all of NASA's stories and highlight the Agency's broad range of work.
- Develop a federated publishing process that would leave editorial control in the hands of local content creators.
- Provide an identifiable NASA "look and feel" that could be readily propagated across NASA Web sites.
- Provide a useful agency-wide Web search capability.
- Provide a secure, distributed infrastructure that would keep NASA's content available and scale easily to handle large peaks in traffic.
- Provide accessibility over high and low bandwidth Internet connections.
- Comply with federal guidelines, such as Section 508 of the Rehabilitation Act and NASA Information Technology (IT) System Security requirements.

Since coming online on Jan. 31, 2003, the Portal operation has met these requirements by:

- Creating a new graphic interface that was rewarded with a Webby in 2003.
- Increasing base level traffic to [www.nasa.gov](http://www.nasa.gov) pages threefold from 2002 to 2003 and by the same amount again in 2003 to 2004. (During the Mars landings of 2004, traffic to [www.nasa.gov](http://www.nasa.gov) increased tenfold.)
- Supporting virtually instantaneous peak traffic that was 20 times the base level with no disruptions to content delivery.
- Achieving record-high customer satisfaction ratings, as measured by a survey available through the Portal.
- Publishing, through the Agency-wide Portal Editorial Board, three to five feature stories, mission updates or interactive elements a week since February 2003. These stories have covered the full range of NASA's programs, from the International Space Station and planetary encounters to aeronautics missions, natural-disaster research and even Center open houses.
- Developing an "affinity kit" that allows agency Web sites outside the Portal to adopt the consistent NASA look and feel.
- Developing automatic publish of text-only site for low-bandwidth users

- Receiving certification that the NASA Portal is compliant with Section 508 of the Rehabilitation Act.
- Handling one of the biggest events in the history of the Internet, the Mars Exploration Rover landings, without any technical issues, serving up nearly 400 million Web pages in 37.6 million user sessions in January 2004.
- Earning the “Best Managed Government Website” award from the Performance Institute (June 2004) and “Pioneer Award” from the eGov Institute (April 2004).
- Saving the Office of Space Operations \$650,000 in bandwidth costs and the Office of Science approximately \$4 million in bandwidth costs for the Mars landing.

The Portal is a key initiative in the agency’s implementation of the Electronic Government Act of 2002 and the President’s Management Agenda. The eGov Act requires federal agencies “to provide citizen-centric Government information and services.” Similarly, the President’s Management Agenda directs e-government efforts to be “citizen-centered,” not “bureaucracy-centered,” and to provide information to citizens in ways that reflect the citizens’ view of the agency, not the agency’s view of itself.

The integration of NASA's public web sites into the NASA Portal has, to date, been a voluntary choice for each mission, program, project, or Center, but this has led to continued inconsistency in the linkage to a single set of NASA goals and initiatives. At this time, NASA leadership has decided to make the agency’s best content consistent and available through the NASA Portal at <http://www.nasa.gov/>. This entails bringing critical, popular, and informational NASA public sites into the Portal, as had been originally intended. The infrastructure has been built to accommodate the integration of the essential sites noted below, but changes in the information architecture and navigation structure will be required. In addition, a significant amount of work is required to apply metadata to and migrate existing content, train publishers, and establish the workflows necessary for ongoing publishing needs so that each site’s publisher(s) are able to effectively manage their content.

## ***II. Benefits of Integration***

Migrating public NASA Web sites into the Portal infrastructure offers a number of benefits to the sites’ managers and to NASA as whole, improving the agency’s communication abilities online and ensuring compliance with relevant laws and federal policy. Integration with the Portal will allow NASA to:

- Present the broadest possible view of its programs to the public in one single online location.
- Manage its content and the content’s presentation in a coherent manner for the clearest possible communication.
- Provide a consistent level of quality of information and a unified agency message to the public.
- Enable projects, programs and offices with small outreach budgets to deliver to wide audiences just like those with large outreach and web development budgets.
- Pool resources and efforts to have an effective search mechanism through existing and new NASA content.

- Manage the security of the hardware and software components of the web infrastructure to meet the new security mandates for federal agencies (See Appendix A - IT Security Considerations for Web Managers).
- Achieve efficiencies in managing the software and hardware infrastructure needed to design, create, and host NASA web content.
- Respond easily and quickly to spikes in public demand for NASA content related to planned or unplanned events.
- Keep the public traffic to a minimum on the NASA operational network. This will increase efficiency and safety in operations of NASA's missions and projects. It will also decrease long-term network upgrade costs.
- Comply consistently with Information Accessibility (508), Privacy (P3P) Federal requirements, proposed Federal Web content standards and other legal requirements.
- Consolidate public content, enabling NASA to take a step towards managing the agency knowledge, as stated in the CAIB report and Diaz plan.
- Obtain up-to-date statistics on content usage and participate in NASA's use of an online customer-satisfaction survey.

Benefits to NASA site managers include:

- Having their content available for inclusion on the top-level portal page that has been downloaded 22.5 million times in 2004.
- Inclusion of their content in any appropriate area of the portal (e.g., all astronomy-related material in the "Exploring the Universe" section).
- Spill-over traffic from inquisitive users visiting to see NASA events.
- Increased visibility of their material through the NASA-wide search capability and browsable directory.
- Reduced long-term design and hosting costs.
- A readily scalable infrastructure for handling high-traffic events.
- Ability to keep site up and communications open when normal local operations are disrupted (e.g., as a result of any natural or man-made disasters).
- Easily obtained metrics on content use and audience patterns.

Overall, the efficiencies of a centrally managed technology infrastructure, with a federated content generation and editorial process, are necessary to manage NASA's brand, which is considered by the general public and the scientific community as a stamp of authenticity and high caliber.

### ***III. Content Management***

The principle of content management -- for the Portal and the large NASA web space -- is simple: NASA content creators and site managers must make material intended for the Portal's audiences -- the general public, students, teachers, kids and the news media -- available to the Portal through its Content Management System (CMS).

Survey data clearly shows that Internet users come to the Portal for information on a broad range of topics, everything from planetary exploration to the history of Apollo, and narrower subjects like solar energy and a particular technology spin-off. Historically, information covering this wide a range of topic has resided on discrete NASA web sites, which are often hard to find

unless a user knows which Center manages a project or which Headquarters office funds it. By bringing all our general content to the Portal, we make it available in one place, and users looking for information on one topic are exposed to many other related topics.

While most Portal users are satisfied with a general level of information, others want to drill deeper for more technically sophisticated content. For NASA's online public communications to succeed, the Portal must, at the top level, present the broadest possible view of NASA, while enabling users who want to find more detailed information to do so easily. To give structure to that effort, the following levels of content have been identified.

1. **Public-focused content:** Content intended for broad general audiences, usually written at a technical level appropriate for readers without college-level education in science or engineering. In material at this level, technically sophisticated concepts must be clearly explained in laymen's terms. "Public-focused" content is distinct from "public content" or "publicly available content"; the last two terms refer to any content that is generally available on the Internet, regardless of its intended audience.
2. **Educational / Kids content:** Content specifically intended for students or educators, often written at a specified grade level. The content may be intended for use in formal educational settings or informal learning environments. Technically sophisticated concepts must not be more sophisticated than the target grade or education level.
3. **News media content:** Material intended to assist the news media in their coverage of NASA, its missions, its scientific discoveries and technological achievements -- typically more technically sophisticated than general content, but still requiring some explanation.
4. **Outreach content:** Content generated by NASA offices that is designed to reach broad audiences, excluding public-focused, educational or news media content. Outreach content has historically been written at inconsistent technical levels.
5. **Professional content:** Content with a specific purpose in mind intended for targeted public audiences, science and engineering professionals, and researchers. Professional content may also include procurement material for business and industry, grant material for scientists and researchers, or scientific material for use in collaborative research. This material will be published as allowed by existing guidelines and processes already in place for such information.
6. **Regional Content:** Content for regions with a major NASA presence, such as a NASA Center and/or JPL.
7. **Employee content:** Material intended for NASA employees or, in some cases, contractors.

To accommodate the above categories of content, the present Information Architecture (IA) of the NASA Portal may be extended and a new navigation structure applied that enables professional and regional content to be presented in an appropriate way. These changes, like all changes to the NASA Portal IA, will be validated and may be revised based on findings from

usability studies and focus group input. In some cases some content may also appear in channels or “portlets” within the MyNASA section of the Portal.

The Portal’s editorial governance, which has been in place since January 2003, defines the editorial, technical, and managerial processes used for managing public content. This governance model will be reviewed and modified as required by the addition of the new content and content categories. Editorial management of the existing Portal varies depending on the content itself and where it resides within the Information Architecture.

The Office of Public Affairs at NASA Headquarters has overall editorial responsibility for the Portal and directly manages the content appearing in the www.nasa.gov domain. The depth and breadth of the Portal’s content (8,500 Web pages in July 2004) makes it impossible for one office to directly manage all content, so through an Editorial Board, responsibility and authority for some portions of the Portal is delegated to section editors or sub-boards. They in turn further delegate responsibility and authority to the authors, contributors, QA, and others within their section.

Section editors and sub-board members are drawn from Center Public Affairs offices, Education offices and mission directorates. Within guidelines set by the board, section editors have broad authority over content within their specific categories.

As responsibility for Portal content is delegated, so is the responsibility for the content’s quality. As an official NASA communication, Portal content, regardless of its source, must be accurate, up-to-date, approved for public dissemination, directly relevant to NASA’s mission, and completely professional in its preparation and presentation.

#### ***IV. Levels of Integration***

The primary goal of this effort is the fullest possible integration of NASA’s Web content and the underlying infrastructure. In an ideal world, all NASA content would be available to any Web editor for inclusion in any appropriate area, regardless of the content’s source. However, more than a decade’s worth of Web history -- thousands of NASA web sites and millions of web pages, with different target audiences -- means that site integration into the Portal may occur in different ways. This integration plan will support contribution, exchange, and publication of a diversity of content items, within a common framework of practice and form.

Achieving this goal requires that all NASA content within the scope of the solution be treated with some degree of effort. The Office of the CIO, the Office of Public Affairs and the site’s manager from various perspectives will assess each NASA Web site. This analysis will start from the assumption that the site will be fully integrated into the Portal. As each site is analyzed, however, it will become readily apparent that many are not candidates for full integration.

Therefore, the integration plan includes several levels of integration. Where a site practically falls within these levels of integration will be determined by several criteria that include:

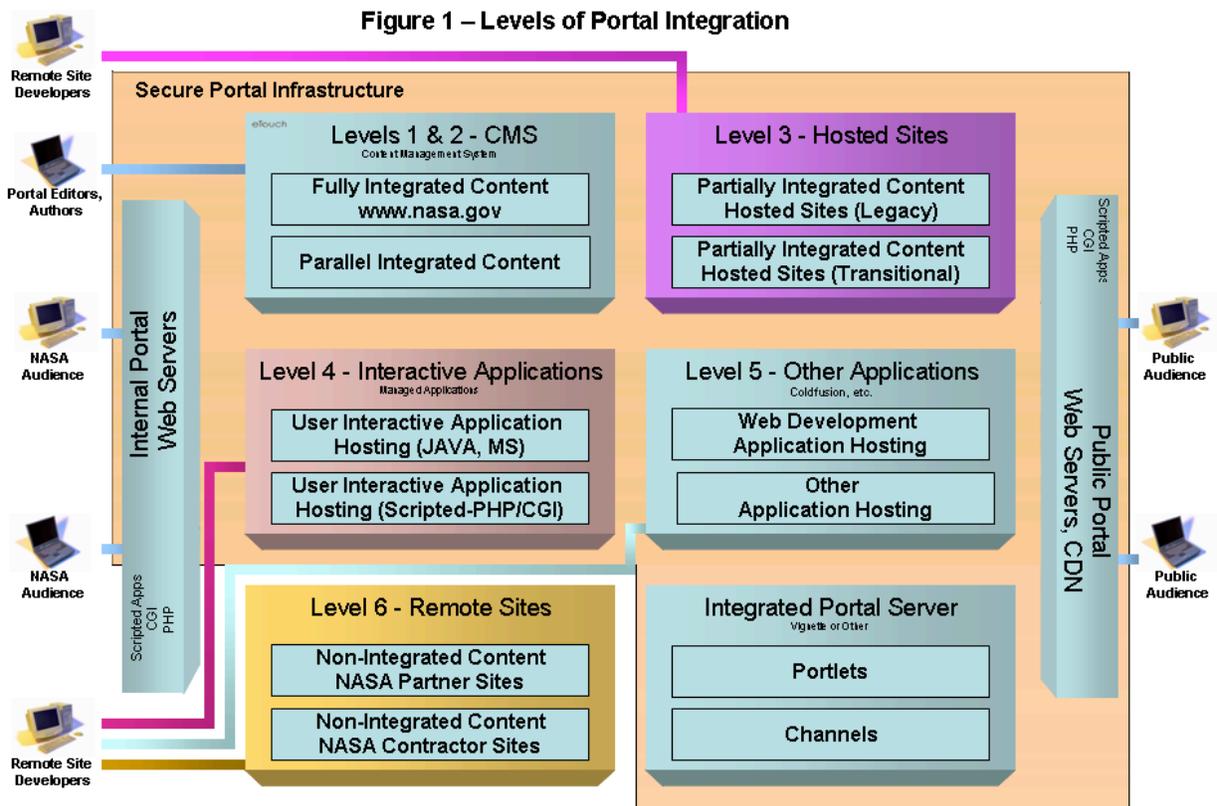
- a. The type(s) of content on a site,
- b. The complexity of the candidate site,

- c. The timely and compelling nature of the site's content,
- d. The technical depth of the content,
- e. The transaction nature of the site, and
- f. The resources available for the integration task.

In order to maximize the value and impact of all efforts, we propose to apply a graduated approach to migrating and transforming content into the NASA Portal. This approach will allow the implementation team to apply a level of integration that optimizes the expense of effort involved. With this approach there are six levels of NASA Portal Integration:

1. Full CMS NASA Portal Integration
2. Parallel NASA Portal Integration
3. Partial NASA Portal Integration
4. User Interactive Application Hosting
5. Web Development Application Hosting
6. Non-NASA Portal Integration

The details of what comprises each of these levels, along with examples of existing sites in each level, are provided below and are functionally shown in Figures 1 and 2:



## 1. **Fully Integrated Content**

Fully integrated content is comprised of largely public-focused, educational, news media or outreach content and is not a part of public transaction applications (see item Level 4 below). This content will be physically moved to the Content Management System in the Portal infrastructure, and made public through the Portal's web servers and caching network. All content will be presented in NASA's look and feel through the use of templates in the CMS. Content will be updated in the Portal CMS by the content authors and developers from the NASA entity generating the content. Metadata consistent with NASA standards and the NASA Taxonomy standard will be applied to all content.

This content can be promoted and may appear in multiple locations, such as the top level of the IA and/or the lower sections of the IA, including mission sections and channels within the MyNASA section. This content can utilize all of the integrated services available within the CMS, which include versioning, auto-publishing, auto-archiving, auto-navigation, scheduled publishing, auto-cache clearing, subscription list services, syndication services, link integrity and 508 compliance checking, multiple workflow management, auto-notification, support services for quality control, metatagging, vetting notification and processes.

## 2. **Parallel Integrated Content**

Parallel integrated content doesn't meet all the criteria outlined above for full integration. However, the content meets some of the criteria as public-focused content, e.g., more specific and targeted content for a specific professional group or content that is commingled with content intended for internal NASA audiences and is not part of a transactional application. This content will also be physically moved to the CMS in the Portal infrastructure, and made public through the Portal's web servers and caching network. All content will be presented in NASA's look and feel through the use of templates in the CMS.

This content will be updated in the Portal CMS by the content authors and developers from the NASA entity generating the content. Metadata consistent with NASA standards and the NASA Taxonomy standard will be applied to all this content. However, this content differs from fully integrated content in that it is maintained and generally published within its own unique IA and not the IA of the NASA Portal (i.e. it resides, is maintained, and is published in parallel to the NASA Portal, not specifically within it). This level of integration may be transitional, anticipating Full Integration later.

The benefit of Parallel Integration is that the content resides within the Portal CMS and can therefore be easily cross published into the Portal IA by simply promoting it in the Portal IA when appropriate. It can also easily be integrated in the channels available in the MyNASA section. Lastly, this content can utilize all of the integrated services available within the CMS, which include versioning, auto-publishing, auto-archiving, auto-navigation, scheduled publishing, auto-cache clearing, subscription list services, syndication services, link integrity and 508 compliance checking, multiple workflow management, auto-notification, support services for quality control, metatagging, vetting notification and processes.

### 3. **Partially Integrated Content**

Partially Integrated Content has been migrated to the Portal infrastructure for hosting and caching in the Portal caching network. This Content is located on a site that is hosted on servers within the Portal infrastructure. The site will be given NASA's look and feel using the affinity kit. However, none of the content will reside in or be updated through the Portal CMS. This level of integration is appropriate for sites that consist mainly of content that doesn't meet certain criteria for full or parallel integration, e.g., content that is primarily archival or legacy in nature, or content that requires substantial manual effort to migrate. This level of integration may be transitional, anticipating Full or Parallel Integration later. It may also be a sub-section or legacy portion of a fully or parallel integrated site that fits the above examples.

Site managers must metatag this content according to NASA standards. This content must be managed and updated by content authoring and publishing applications other than the Portal CMS.

Site managers and content creators should bear in mind that operating on this level of integration may require them to create content twice, or manage syndication processes for new content to be available to the NASA Portal. In addition, while publishing from a user-designated staging area to the NASA Portal Web servers is a service available to these sites, cache-clearing manifests must be provided by the site managers as part of the publishing process. In general, this content cannot utilize the other integrated services available to **Fully Integrated or Parallel** Integrated content without customized integration to those services.

### 4. **User Interactive Application Hosting**

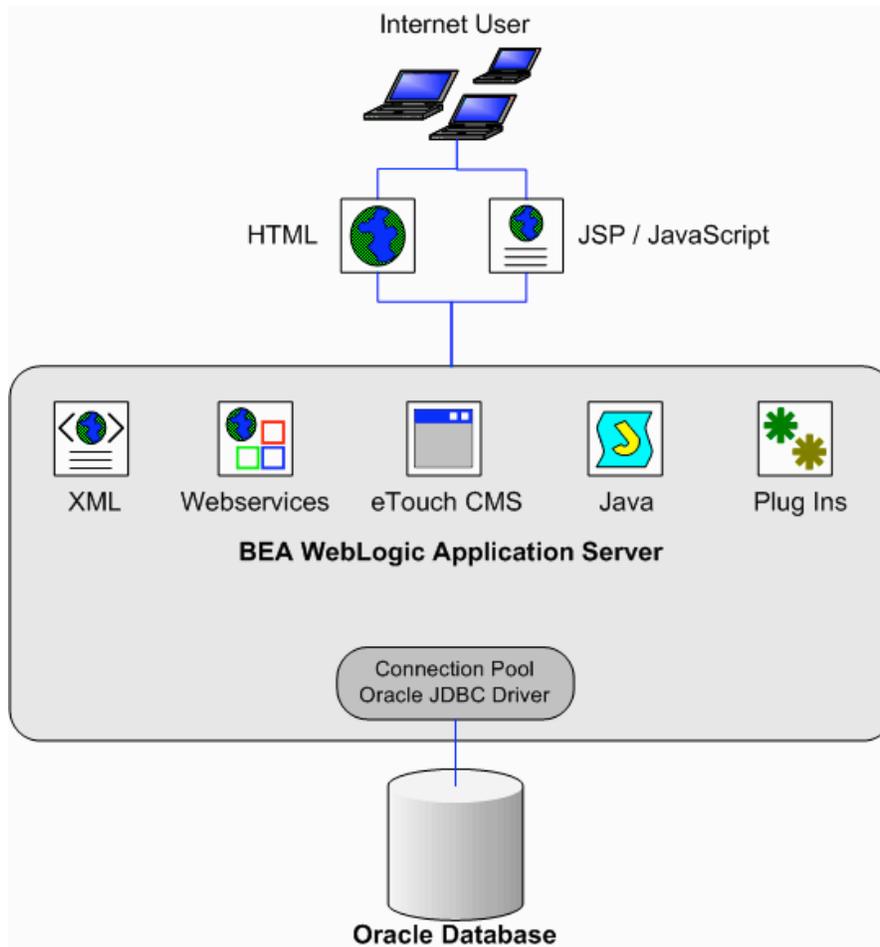
User Interactive Application Hosting are sites, or portion of sites, that provide dynamically changing content via JSP-, ASP- or PHP-based applications, or where the application requires direct transactional request/response from the viewer such as interactive Flash, JAVA, Microsoft, or scripted applications. Figure 2 shows an example of JAVA-based applications of this type. Because of the nature of these sites, full or parallel integration isn't practical, or in many cases even possible. In these cases the applications will be hosted within the Portal infrastructure, but content will not be migrated into the CMS. Where appropriate, links to the content will be provided within the Portal IA, preferably through promotional and metadata information that is entered into the Portal CMS.

Site managers must metatag this content according to NASA standards. This content must be managed and updated by content authoring and publishing applications other than the Portal CMS. The presentation of the content from these sites will use NASA's look and feel or an adaptation of NASA's look and feel that is clearly identifiable with NASA and validated through industry-standard usability testing.

Site managers and content creators should bear in mind that where these applications aren't a part of an integrated site, the NASA Portal search engine must properly index the non-interactive content within them, as well as the entry points to the interactive application, to

enable users to locate these applications in a timely and effective manner. Similarly, the managers of these applications will be responsible for creating appropriate portlets or channel links to myNASA.

**Figure 2 – Example of JAVA Based Applications**



## 5. Web Development Application Hosting

Web Development Application Hosting is appropriate for applications that have been instituted primarily for the management of Web-authored content and Web navigation. In many cases these applications may also be the same ones used for the “User Interactive Applications” methodology stated above. However, in this case the sites actually don’t meet the criteria for User Interactive Applications. The content is static and the application facilitates the presentation of the content. Where there is a compelling justification, these applications will be hosted within Portal. One example of a compelling reason is that managing content in these applications is transitional, integrated at this level in anticipation of using the Fully Integrated or Parallel Integrated methodology at a later date. Another example might be that content is managed in a joint program with certain NASA partners and cannot be done through any other integrated means.

Site managers must metatag this content according to NASA standards. This content must be managed and updated by content authoring and publishing applications other than the Portal CMS. The presentation of the content from these sites will use NASA's look and feel or an adaptation of NASA's look and feel that is clearly identifiable with NASA and validated through industry-standard usability testing.

Site managers and content creators should bear in mind that site content appropriate to the Portal will have to be entered into the CMS, possibly requiring duplicative content creation processes, or at least syndication of promotional information via RSS or full content syndication. Also, the content must be indexed by the NASA Portal search engine to enable users to locate these applications in a timely and effective manner. Similarly, the managers of these applications will be responsible to create appropriate portlets or channel links to myNASA.

## **6. Non-Integrated Content**

Non-Integrated Content is not hosted in the Portal infrastructure. This content resides on sites that are not hosted on servers within the Portal infrastructure. This level of affinity is only appropriate for sites that have ongoing business requirements that the Portal cannot satisfy. This option is the least desirable and will be approved only on a case-by-case basis. Web Site owners will be required to submit a formal application to the NASA CIO to request waivers for not participating in the Integration Levels 1-5 above.

Depending on the technical requirements for the content, it could remain on existing infrastructure and be made public through the Portal's caching network with the URL of the site presented in the same format as the NASA Portal URL i.e. **[www.nasa.gov/sitename](http://www.nasa.gov/sitename)**. Links will be provided in the Portal IA at levels appropriate to the content.

In this case obviously content will be updated outside the Portal infrastructure. As in all other integration levels, the presentation of the content from such sites will use NASA's look and feel or an adaptation of NASA's look and feel that is clearly identifiable with NASA and validated through industry-standard usability testing.

Site managers and content creators should bear in mind that site content appropriate to the Portal will need to be entered into the CMS, possibly requiring duplicative content creation processes, or at least syndication of promotional information via RSS or full content syndication. The content will also need to be indexed by the NASA Portal search engine to enable users to locate these applications in a timely and effective manner. Similarly, the managers of these applications will be responsible to create appropriate portlets or channel links to myNASA.

## **7. Other Integration Considerations**

In every level of integration described above there may be situations requiring the integration of database capability for managing content that cannot be done with the CMS. These

requirements will be met within the Portal infrastructure by the availability of secure, high availability, managed databases that can include Oracle, MySQL, and/or MS Sequel. Best industry practices for enterprise-level managed database services will be applied to these installations.

Many references are made to MyNASA in the description of the levels of integration. MyNASA Portal Server functionality will be expanded to provide navigation to sites not fully or parallel integrated as described above.

**NOTE:** Ultimately, all of NASA's publicly available sites will have the NASA look and feel, as shown on the Portal, and will use the NASA's naming schema.

## ***V. Integration Steps***

The sequence of tasks for migrating the content from the various NASA sites will be as follows:

1. Analyze Content
2. Move content from source to working area
3. Segregate location in Portal CMS Taxonomy
4. Modify the Information Architecture
5. Define Metadata
6. Execute Import Scripts
7. Create Authoring and Presentation Templates

Appendix B – Examples of Site Integration Planning provides several examples of analysis of site content and reassignment to the existing Portal IA. In these examples several minor modifications to the Portal IA were identified.

Following are the tasks involved in site integration, including site analysis:

### **1. Analyze Content**

Content analysis requires identifying various site locations from which content needs to be migrated. Identified sites are then manually analyzed for content, walking through the entire sitemap. The minimum objectives for content identification (but not limited to), are:

- Identify sites or portions of sites that will be entirely imported into the CMS as Level 1 or Level 2 Integration.
- Identify sites or portions of sites that will be hosted in the Portal infrastructure as Level 3 Integration.
- Identify sites that will require Level 4 or Level 5 application Integration.
- Identify sites that will be remotely hosted as Level 6 Integration.

Some considerations that should be applied in determining the appropriate level of integration are:

*Public Freshness and Relevance?*

Would public, educator, student or news media audience(s) be looking for or benefit from seeing this type of content?

*Follows a consistent HTML structure?*

Does the current Web site use template design format? If so, a script will be written to transfer the content to an import template format.

*Follows consistent layout?*

Is there consistency throughout the site? For example, a news release site with consistent layout and structure usually proves easy to import through scripting.

*Time to automate?*

Consider the time required to write the script, versus the time to copy and paste the content. If it will take a week to write and test a script, but copy and paste will take only two to three days, the less automated route may be preferable.

*Content Volume?*

How much content is to be moved? Is the existing content up-to-date or is there a lot of information that will be revised before moving to the new version? If the current content is outdated or requires detailed revision, it may make more sense to split the content into Level 1 or 2 ongoing portions and a Level 3 hosted portion.

The outcome of Content Analysis is a list of NASA web site sections, with their content identified, which can be imported using an automated import process.

## **2. Move content from source to working area**

Because content from original NASA sites is stored in various formats, such as file systems, content management systems, databases etc, the second step in the integration process is to export/extract (such as crawl or copy) all the content to a local file system. This makes writing the actual import script easier and generic. The content exported will include text, imagery and multimedia available from the source web site.

## **3. Segregate location in Portal CMS Taxonomy**

This step defines where imported content will reside within the CMS as Level 1 or Level 2 Integrated Content. Although the CMS has a well-defined taxonomy, imported content may be stored in CMS within its existing site structure until it can be classified to the established standards.

There are number of reasons for segregating the taxonomies for existing content and the imported content within the CMS. One, the imported content may not have a placeholder in

the existing taxonomy, in which case some effort may be required to validate through usability studies where the content should reside within the Portal IA. Second, the imported content may not have enough metadata or be properly metatagged. Third, new content taxonomy will evolve as business processes mature and new requirements are identified. Fourth, import scripts will be generic and simple.

#### **4. Modify the Information Architecture**

Where required, modifications to the IA of the Portal may be required. Where required, a usability study will be conducted to validate the changes from an audience perspective.

#### **5. Define Metadata**

All metadata nodes present in content will be imported ‘as is’ into the CMS. Additional attributes can also be defined in the import scripts, if they are known at the time of import. In many cases existing metadata may be incorrect or incomplete, in which case metadata properties can also be defined manually once the data is imported into the CMS.

It is important to note that published content will have only those metadata values which have either been imported ‘as is’ or scripted or manually updated.

#### **6. Execute Import Scripts**

The import scripts will:

- Preserve and extract the Content Body of web pages.
- Create XML templates based on the content structure.
- Migrate related images and content items included in the web pages, into the Portal CMS content library.
- Resolve all <IMG> tags and hyperlinks to point to the Portal CMS content library.
- Upload transformed content into a segregated taxonomy in the Portal CMS.

#### **7. Create Authoring and Presentation Templates**

Some site content may require customized content authoring templates due to the nature and organization of the content.

A number of different types of presentation templates are available within the CMS. Preferably, these templates can be used with minor modifications for most content. These include index or landing pages, feature articles, and archive templates for:

- a. Mission Directorates
- b. Vision Categories
- c. Education Categories
- d. Kids Categories
- e. Mission Support Offices

- f. Centers
- g. Projects and Programs
- h. Periodic Magazine Formats
- i. RSS Syndication
- j. NASA Letterhead
- k. Basic Text

Where new templates are required, they will be custom developed at a cost to the migrating site. The NASA Portal Editorial Board will validate the templates and navigation structure for sites focused on the portal's target audiences.

Professional content or content intended for targeted audiences not evident in the IA may be migrated into the Portal CMS and presented using the channels capability in the MyNASA section. A home page for that content may be created in the Portal with a distinct URL as defined in section VII. This URL must be approved by the Editorial Board. The home page will be a substitute for the current opening page of the site and will be presented using the templates available.

### **Sites Targeted for Import**

Development of the complete list of sites that are to be imported is still underway. Initial analysis has determined that 20% of sites (approximately 170) in the nasa.gov domain account for about 80% of NASA's digital assets. Of those sites the Portal Team recommends that the following sites be targeted initially for Level 1 or 2 integration into the Portal infrastructure.

#### ***Center Home Pages and Public Affairs Sites***

- ARC [www.arc.nasa.gov](http://www.arc.nasa.gov)
- ARC public affairs [amesnews.arc.nasa.gov](http://amesnews.arc.nasa.gov)
- DFRC [www.dfrc.nasa.gov](http://www.dfrc.nasa.gov) (no PAO site)
- GRC [www.grc.nasa.gov](http://www.grc.nasa.gov)
- GRC public affairs [www.grc.nasa.gov/Doc/news.htm](http://www.grc.nasa.gov/Doc/news.htm)
- GSFC [www.gsfc.nasa.gov](http://www.gsfc.nasa.gov) (no PAO site)
- HQ [www.hq.nasa.gov](http://www.hq.nasa.gov)
- HQ public affairs <ftp://hq.nasa.gov/pub/pao> (already completed)
- JPL [www.jpl.nasa.gov](http://www.jpl.nasa.gov) (no PAO site)
- JSC [www.jsc.nasa.gov](http://www.jsc.nasa.gov) (no PAO site)
- KSC [www.ksc.nasa.gov](http://www.ksc.nasa.gov)
- KSC public affairs [www-pao.ksc.nasa.gov](http://www-pao.ksc.nasa.gov) and [www.ksc.nasa.gov](http://www.ksc.nasa.gov)
- LaRC [www.larc.nasa.gov](http://www.larc.nasa.gov)
- LaRC public affairs [www.larc.nasa.gov/news\\_and\\_events/](http://www.larc.nasa.gov/news_and_events/)
- MSFC [www.msfc.nasa.gov](http://www.msfc.nasa.gov)
- MSFC public affairs [www.msfc.nasa.gov/news/](http://www.msfc.nasa.gov/news/)
- SSC [www.ssc.nasa.gov](http://www.ssc.nasa.gov)
- SSC public affairs [www.ssc.nasa.gov/~pao/news/](http://www.ssc.nasa.gov/~pao/news/)
- Wallops [www.wff.nasa.gov](http://www.wff.nasa.gov)

The effort required for this integration will be borne by the Public Affairs offices at the respective Centers.

### ***Mission Offices/Enterprise Home Pages***

- Exploration Systems <http://exploration.nasa.gov> ; <http://spaceresearch.nasa.gov>
- Space Operations <http://www.hq.nasa.gov/osf>
- Science <http://spacescience.nasa.gov> ; <http://earth.nasa.gov> and <http://science.msfc.nasa.gov>
- Aeronautics <http://aerospace.nasa.gov>
- Education <http://education.nasa.gov> is currently in the NASA Portal. Integration of program-specific sites will need to be included into the Portal infrastructure.

The resources required for this integration effort will be borne by the respective mission directorates or offices.

Additional analysis will be conducted of the remaining sites identified in Appendix C to determine the integration option most appropriate to those sites, based on their infrastructure needs and the resources available from the content owners to facilitate the integration. A ranking priority will be established to conduct the analysis.

## ***VI. Technical Considerations***

The existing NASA Portal infrastructure is able to handle import of the sites listed above. Analysis of the remaining of the 170 sites may drive increased storage or license needs and will be specified in the analysis report.

The key components of the technical plan include

1. Content Standardization: e.g. Header and footer links.
2. Uniform look and feel throughout the sites-- this will be achieved by use of templates and adherence to published Portal Standards and Guidelines.
3. URL Naming conventions -- new sites will come into the Portal umbrella under the primary [www.nasa.gov](http://www.nasa.gov) URL. Sub-sites will follow a naming convention, such as [www.nasa.gov/sitename](http://www.nasa.gov/sitename).
  - Naming structures will be independent of the NASA organization structure to ensure long-term stability of the site names.
  - Sites with duplicate naming conflicts (e.g. [science.jpl.nasa.gov](http://science.jpl.nasa.gov), [science.nasa.gov](http://science.nasa.gov) and [science.arc.nasa.gov](http://science.arc.nasa.gov)) whose owners may all request [www.nasa.gov/science](http://www.nasa.gov/science) will be brought to the attention of the NASA Editorial Board. The board will work to resolve duplications for sites focused on the portal's target audiences or defer to an appropriate, authoritative organization for other audiences.
  - The technical solution would ensure that the existing URLs have a proper set of re-directs, so as not to break existing bookmarks users may already have created by

coordinating the creation of redirects, DNS switches, and other technical aspects to ensure a smooth transition with the appropriate responsible NASA personnel.

4. Technical infrastructure implication: An assessment will be done whenever a site is being evaluated for integration into the Portal to determine whether additional hardware or software licenses will need to be procured to sustain the load when the new site is added to the Portal infrastructure
5. Scalability
6. Content Integration: Options will be assessed whenever appropriate for full content integration into the CMS vs. a hosting solution.
7. Migration off of existing systems: If certain sites are already using content management software-- home grown or COTS -- for managing static content, the first option will be to migrate content off the existing system to the Portal CMS. In exceptional situations an assessment will be done to determine if the existing software needs to remain in service.
8. Applications and Databases: Need for additional databases and application servers will be assessed, if needed.

### ***VII. Roles and Responsibilities***

Because the Portal's primary goal is to present the best of NASA's general content in one place, the Portal managers and individual site managers will need to be sure that such content is properly promoted to the Portal. This is true regardless of which level of integration is appropriate for the site. To ensure a clear understanding among all parties of their responsibilities, a Portal Content Agreement will be prepared for each site that clearly specifies the roles and responsibilities. While the agreements may vary among different sites, the basics are outlined here:

As manager of the Portal infrastructure, the NASA Chief Information Officer or designee will:

- Work with the site manager and the Internet Services Manager to assess the type of content on the site.
- Work with the site manager to assess the size of a site and the work required to migrate it to the Portal.
- Agree with the site manager and the Portal content editor on the appropriate level of integration.
- Work with the site manager to develop a cost and schedule for integration.
- Work with the site manager to resolve any technical issues that arise during and after integration.
- Arrange for CMS training for personnel designated by the site manager as content providers.
- Ensure quality-assurance resources are available to site managers as part of the publication process, and ensure that QA personnel are familiar with federal laws and policies regarding Web content.

As manager of the Portal content, the Office of Public Affairs, through the Internet Services Manager, will:

- Work with the site manager and the CIO or designee to assess the types of content on the site.
- Work with the site manager to identify content appropriate for promotion to the Portal through the CMS.
- Agree with the site manager and the CIO or designee on the appropriate level of integration for the site.
- Designate primary and secondary areas of the Portal's IA where the promoted content will be promoted.
- If appropriate, extend and deepen the Portal IA -- including possibly creating new sections of the Portal to accommodate content.
- Work with the site manager to develop necessary navigational elements and templates.
- Work with the site manager to reach agreement on publication processes and schedules.
- Work with the site manager to resolve content or publication issues.

The site manager will:

- Work with the CIO or designee and the Internet Services Manager to assess the types of content on the site.
- Work with the Internet Services Manager to identify content appropriate for promotion to the Portal through the CMS.
- Work with the CIO or designee and the Internet Services Manager to reach agreement on the appropriate level of integration for the site.
- Work with the CIO or designee to develop a cost and schedule for integration.
- Work with the CIO or designee to resolve any technical issues that arise during and after integration.
- Work with the Internet Services Manager to develop necessary navigational elements and templates.
- Work with the Internet Services Manager to reach agreement on publication processes and schedules.
- Designate personnel who will provide content to the Portal.
- Work with the Internet Services Manager to resolve publication or content issues.
- Make designated personnel available for training and provide them with sufficient resources to provide content to the Portal.
- Ensure designated personnel are available to work as necessary with the Portal Editorial Board.
- Ensure designated personnel respond in a timely manner to editorial queries and suggestions from the Portal Editorial Board.
- Upon request from the Portal Editorial Board, ensure designated personnel enter content into the CMS for promotion to the Portal (for sites below Level 2 integration).

### ***VIII. Schedule***

The overall schedule for this task began on July 1, 2004. The first task in the schedule was completion of this Implementation plan by August 30, 2004. Discussions for Center Site integrations began in mid July and have proceeded in parallel with the development of this plan. Because of the early efforts on Center site integration, actual integrations of Center site content

could be completed as early as November 30, 2004. All other site integrations will not begin before December 1, 2004. A slip in the start date equates to a slip (day for day) to the overall schedule. Depending on the schedule options described below, estimated completion for all 170 sites could be accelerated to as early as March 31, 2005, or no later than the end of the NASA Portal contract on May 30, 2007.

The schedule includes several short-term activities and milestones related to process and communications. Some of these activities have already begun with the participation of the advisory board during the August 16<sup>th</sup> through 30<sup>th</sup> period. In addition, upon agreement of the plan by the CIO and PAO offices, the full communication plan will be begin. It includes:

1. A 14-day period for review and response by all sites and site management.
2. Face-to-face meetings at each Center and with each directorate and with all functional groups for review and discussion of this plan.
3. Startup of an internal NASA Portal integration forum where threaded conversations, questions, etc. from the various groups involved will be fielded.
4. Startup of an Integration Cost Calculator Application that will allow site managers to estimate the cost of integration, based on a site inventory and asset analysis.
5. Functional mockups of the each Level of Integration showing how the site integrations will be linked back to the NASA Portal.
6. A full description and cost estimation for ongoing chargeback costs.
7. Ongoing refinement and adaptation of this plan and the associated project schedule based on collective feedback from the communication activities.

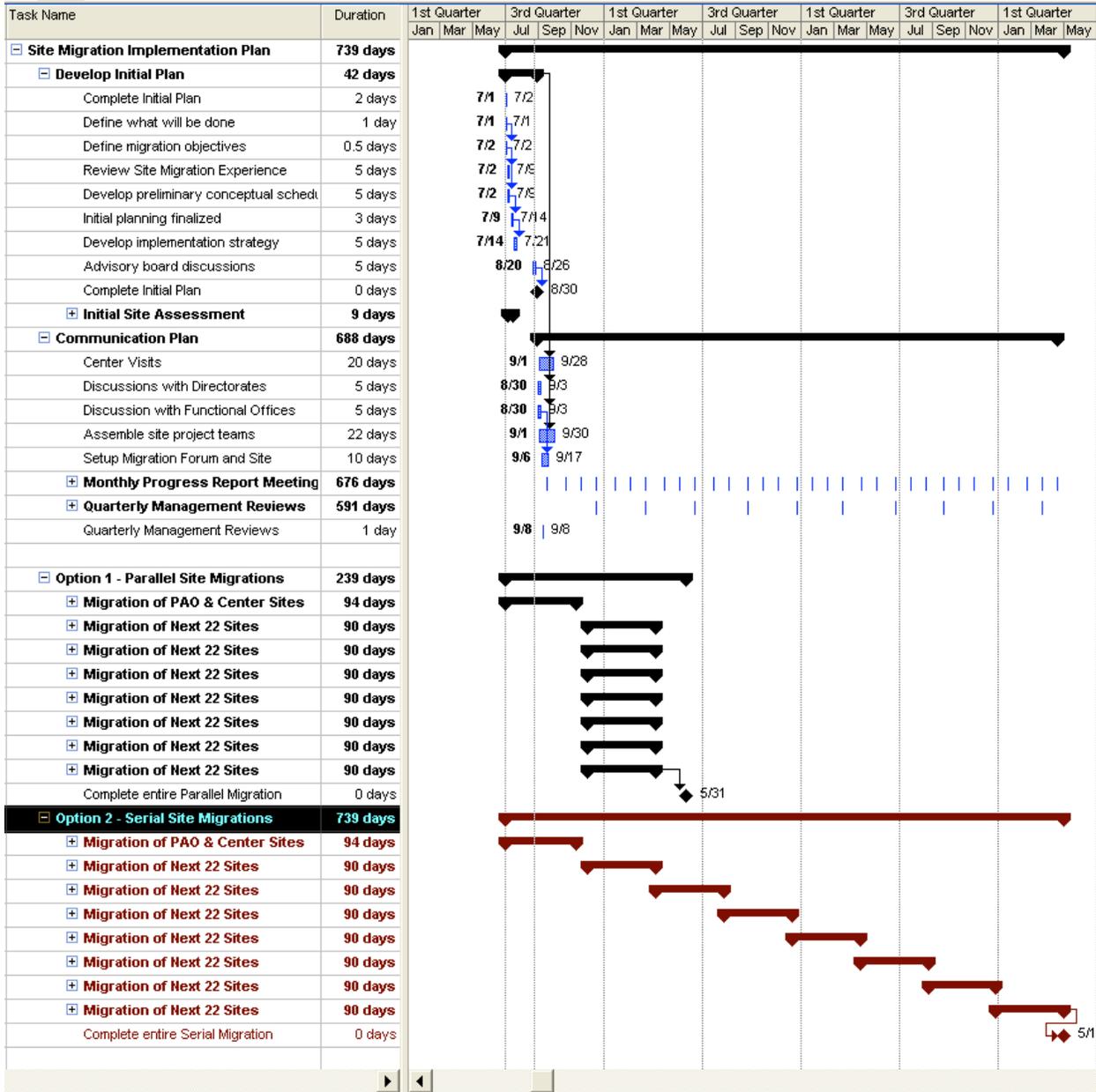
While the responsibility of accomplishing the plan falls with the PAO and CIO offices, the intent is that the interactive participation of all of affected site managers will be used continually to achieve successful completion with minimal risk and costs.

**Schedule option 1 – Parallel Schedule:** The integration of individual sites will occur in parallel. Integration of the 16 Center sites will be completed no later than November 30, 2004. The estimated time to completion -- from the point of decision to the time the publishers are using the CMS for publication, based on the experience from previous site imports, training, etc. -- is 16 weeks. Timing for publishing new sites effectively limits the efficiency beyond 16 weeks. Assuming the remaining 154 sites are divided into 7 groups of 22 sites and that each group is migrated in parallel beginning December 1, 2004, then the integration of all groups would be completed no later than March 31, 2005.

**Schedule option 2 – Serial Schedule:** The integration of each of the 7 groups of 22 sites will occur serially. Integration of the 16 Center sites will be completed no later than November 30, 2004. The remaining 154 sites will divided into 7 groups of 22 sites, and each group will be migrated serially beginning December 1, 2004. Under this option the groups would be migrated, one group after another, using the same 16-week period discussed in Option 1, and the integration of all groups would be completed no later than May 30, 2007.

Figure 3 shows this schedule with the two options.

**Figure 3  
Implementation Schedule**



**IX. Budget**

The following budget discussion is focused on the cost of integration, not the charge back for ongoing operation.

The budget for the initial integration task ranges from \$2,000,000 to more than \$12,000,000, depending on the level of responsibility that eTouch Systems or a follow-on Portal contractor is asked to take in the integration effort. To clarify, the budget provided in this plan is specifically only for those costs associated with the outsourced efforts in the integration. These efforts can

span from minimally involved to heavily involved, and are reflected in the range of costs provided above for the import of 250,000 base HTML pages and approximately 700,000 assets.

However, based on typical existing site integration experience, the integration costs would not be expected to exceed \$6,000,000.

This is all inclusive of

- Training of publishers and site managers as noted above.
- Importing content.
- Administering CMS workflows and user accounts.
- Quality assurance to 99.5% of layout and positioning.
- Identification and notification of broken links.
- Migration of suitable existing metatags and adding some additional metatags.
- Fully supporting site manager involvement in the transition to the new environment, including daily meetings during the critical transition time.
- Handling all redirects and DNS switching issues for a smooth transition.
- Setting up metrics-reporting mechanisms for each new high-level site.
- Managing the entire project to completion, including weekly status reports and tracking of all sites and their progress.

Appendix D - “Simple Example of Integration Effort” provides a more thorough discussion of a simplified example of how the costs are impacted by contractor involvement.

Table 1 – “Estimated One-Time Cost for Integration” can be used to provide guidance to site sponsors in estimating the initial one-time cost of integration for Level 1 or Level 2 integrations. Other levels of integration involve costs that are to be determined (TBD) on a case-by-case basis. Table 1 provides a simplified approach of an average cost per page for three levels of outsourced effort. These are:

1. Full outsource
2. Typical outsource.
3. Minimal outsource.

Not included in the table are the costs for customized situations that may be applicable to certain sites. These could include, but are not be limited to, specialized storage requirements, third-party usability studies, and incremental data center upgrade costs.

**Table 1 – Estimated One Time Cost for Integration**

Integration Level >	Level 1			Level 2			Other		
	Full Outsource	Typical Outsource	Minimal Outsource	Full Outsource	Typical Outsource	Minimal Outsource	Full Outsource	Typical Outsource	Minimal Outsource
Analyze content	***	**	*	***	**	*			
Create, modify, or assign to existing IA	***	**	*	***	**	*			
Validate IA with Usability Study (excludes direct costs)	***	**	*	***	**	*			
Mark and tag content	***	**	*	***	**	*			
Create or modify templates	***	**	*	***	***	***			
Bulk migrate content	***	***	**	***	***	**			
Resolve migrated asset links	***	***	**	***	***	**			
Create graphic labels	***	*	*	***	*	*			
Assemble banners, etc.	***	*	*	***	*	*			
Create collections	***	**	*	***	**	*			
Define & apply metadata	***	**	*	***	**	*			
QA cycles on migrated content	***	*	*	***	*	*			
Accessibility audit cycle	***	**	*	***	**	*			
Define editorial process	***	*	*	***	*	*			
Create appropriate CMS workflow	***	***	***	***	***	***			
Create CMS users and assign roles	***	***	***	***	***	***			
Train CMS editors/users	***	**	*	***	**	*			
Hand over to Management (Go Live)	***	***	***	***	***	***			
Install or upgrade servers (excludes direct costs)	***	***	***	***	***	***			
Install or upgrade Storage (excludes direct costs)	***	***	***	***	***	***			
Purchase application licenses (excludes direct costs)	n/a	n/a	n/a	n/a	n/a	n/a			
Integrate with database (excludes direct costs)	n/a	n/a	n/a	n/a	n/a	n/a			
Create infrastructure staging site	n/a	n/a	n/a	n/a	n/a	n/a			
Design integrated connection path	n/a	n/a	n/a	n/a	n/a	n/a			
Security audit for direct staging access	n/a	n/a	n/a	n/a	n/a	n/a			
Create SFTP & SSH users	n/a	n/a	n/a	n/a	n/a	n/a			
Modify publishing and CDN purge scripts	n/a	n/a	n/a	n/a	n/a	n/a			
Map and manage required DNS changes	***	**	**	***	**	**			
Create required URL redirects	***	***	***	***	***	***			
Estimated Cost Per Page Content Migrated	\$50	\$22	\$8	\$44	\$22	\$10			

**Legend**

\* Contractor involved in advisory role.    \*\* Contractor shares effort with site management.    \*\*\* Contractor conducts all aspects of task.  
 To be determined.    n/a Not applicable- these items are included services in Level 1 and Level 2 CMS Integrations

Table 1 is intended to be a relative guide for rough order of magnitude budgeting. Experience has shown that every site is unique and, as a result, estimates need to be done for each site to determine actual costs. Individual sites will generally cost between \$25,000 and \$350,000. In addition, sites that include underlying applications, inconsistent metadata or navigation, and other complexities may cost more. (See risks below.)

It's important to note that the minimal outsource column in Table 1 is achievable with full cooperation of all site sponsors, and the example site integration plan provided in Appendix B is the first step in planning for a minimal-cost integration.

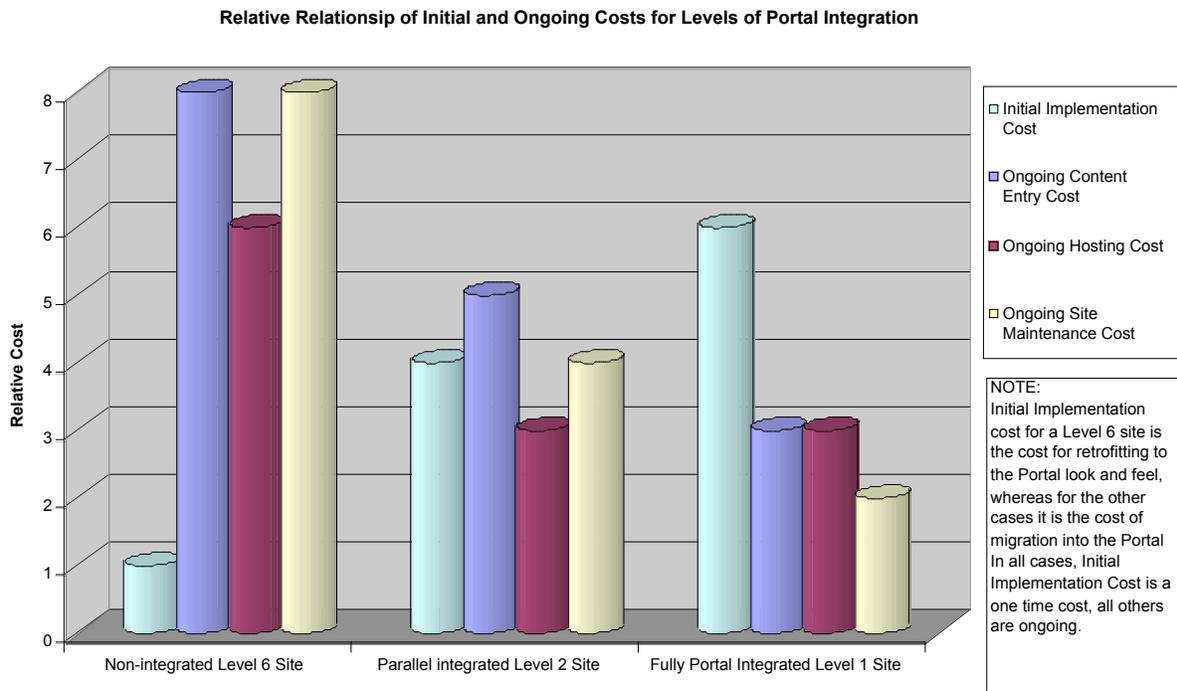
The estimated cost provided in Table 1 addresses just the initial cost of integration. There are other considerations a site manager must factor into the decision process to determine what level of integration to consider. These include measurable ongoing operating costs, as well as more esoteric considerations relating to the increased likelihood of content being seen by a broader audience when migrated as Level 1. Other factors that should also be included are the broad

range of ancillary services that are directly available to sites that reside in the Portal CMS. The integrated services available to CMS sites include versioning, auto-publishing, auto-archiving, auto-navigation, scheduled publishing, auto-cache clearing, subscription list services, syndication services, link integrity and Sec. 508 compliance checking, multiple workflow management, auto-notification, support services for quality control, metatagging, vetting notification and processes.

As mentioned above, measurable ongoing operating costs should also be considered.

Table 2 puts into perspective the relationship between relative levels of the measurable cost for Level 1 - Full CMS NASA Portal Integration, Level 2 - Parallel NASA Portal Integration, and Level 4 - Non-NASA Portal Integration. All of these costs factors must be considered when a site manager considers what level of integration to select.

Table 2



## X. Risks and Risk Mitigation

### Risks

The effort required on the part of each owner or Directorate or Center is proportional to the complexity of the existing site and the complexity agreed to for importing content. Import complexity, in order of increasing complexity is:

- Shallow import of content to allow for FTPF publishing from the CMS.
- Full site import into existing site IA structure.

- Full site import with new site IA structure.
- Full site import with complete separation of content from presentation.

While we can facilitate the effort in every case, as the complexity increases more resources and/or more time will be required on the part of the owner of each site. The separation of existing content from existing site IA can only be done by appropriate content experts. The rough order of magnitude estimate assumes those experts will be provided by NASA. Based on experience of previous integrations, roughly two full-time individuals will be required from NASA for each site. JPL and/or Etouch can provide experts as an alternative; however, this will impact final cost.

Center sites generally have many embedded legacy sites that have distinct URLs and no cross-navigation from the active site. These sites may or may not be included in the estimated total assets. In general, the proposal is to handle each of these sites as external legacy hosted sites.

### **Risk Mitigation**

The risk mitigation strategy for schedule and budget are the same: limit the depth of complete site import as necessary to maintain cost and schedule. This approach may be used by NASA to limit the extent of NASA resources that can be assigned to the task, or by JPL to limit the fixed cost constraints imposed by the approach.

Costs can be significantly reduced by application of this approach. The least costly and most timely approach, for example, would be to import just enough content from each site to allow a smooth transition to publishing from this point forward from the CMS.

# APPENDIX A

## IT Security Considerations for Web Managers

### IT Security Objectives

- Security Benefits of Public Web Integration
  - A clearer delineation of public and private allows for a more defensible architecture.
  - Reduces the ad hoc or inadvertent hosting of external-facing Websites
  - Allows for economies of scale to be gained in addressing Federal and NASA security policies
- Mitigation of IT security technical risks
  - Ensure Confidentiality, Integrity, Availability, and Authenticity
  - As appropriate – prevent denial of service (DOS), interception, modification, and masquerading
- Mitigation/Elimination of content risks
  - Develop process for content review to ensure inadvertent posting of sensitive information and/or IT architecture elements that facilitate attacks

### Overview of Applicable Federal Requirements

- Federal Information Security Management Act (FISMA)
  - Covers data and systems in direct control of an agency as well as agency data a systems under the control of a third party (e.g., contractor, outsourcer, grantee) to perform work on behalf of the agency.
    - In storing NASA data, the NASA Public Website will be required to meet FISMA requirements documented in the update NPR 2810.1 and will require annual reviews to verify compliance.
    - This requirement extends to any hosting relationship in which a third party publishes NASA data.
  - Mandates use of NIST guidance (I.e., Federal Information Processing Standards and Special Publications)
  - To perform security posture assessments, FISMA requires annual reviews of contractor facilities.
  - Must comply with Federal requirements for the protection of privacy

### Overview of Applicable NASA Requirements

- NASA IT Security Policy
  - Translates voluminous Federal requirements into IT Security Policy for NASA
    - Primarily -- NPR 2810 and NPR 1620
    - SOW/PWS should make clear the contractual obligation to adhere to these requirements
- NASA IT Security Clause for Contracts (Procurement Information Circular)
  - Defines requirements for outsourcing/contractor relations:
    - Development of an IT Security Plan
    - Conduct of Background investigations for privileged/limited privileged administrators
    - Administer annual IT Security and Awareness Training
- Additional IT Security Considerations
  - Negotiate the inclusion of quarterly vulnerability scanning, patch management, incident response capability, etc.

## APPENDIX B

### Examples of Site Integration Planning

#### EXAMPLE 1 - Human Space Flight Web

**Note:** The reference to “Level I Navigation,” “Level II Navigation” is the designation chosen by this team to denote where content should reside within the Portal and is unrelated to the Levels of Integration described above.

#### 1.0 Introduction

This proposal shows where the content from the Human Space Flight Web (HSF) will be placed on the NASA Home Page (Portal). A written description is provided matching HSF content to the various Portal sections. Visual maps are attached showing where the HSF content will be imported inside the Portal.

Table 1: Site Summaries

Portal Site	HSF Site
<ul style="list-style-type: none"><li>• For Kids</li><li>• For Students</li><li>• For Educators</li><li>• For Media and Press</li><li>• News and Events</li><li>• Multimedia</li><li>• Missions</li><li>• Humans in Space</li><li>• Life on Earth</li><li>• Exploring the Universe</li><li>• About NASA</li><li>• Popular Topics</li><li>• My NASA</li></ul>	<ul style="list-style-type: none"><li>• Shuttle</li><li>• Station</li><li>• Real-time Data</li><li>• News</li><li>• Gallery</li><li>• Questions</li><li>• History</li><li>• Info.</li><li>• Sitemap</li><li>• Search</li></ul>

#### 2.0 HSF to Portal Content Mapping: Level I Navigation

There are five sections on the Portal where HSF content can be placed. Though HSF content may be specific to Humans In Space, current Portal navigation allows the content to be distributed based on attributes such as news, missions and multimedia. While some content may be stored in a particular directory it can be linked to from any other page or section.

The five Portal sections to which HSF content can be imported are:

1. For Media and Press
2. News and Events
3. Missions
4. Multimedia
5. Humans In Space

Some HSF features such as Press Releases, Ask the Expert, Day Facts and Search may be difficult to import into the Portal due to technical issues, and may not be feasible at all. It may also be necessary to enhance the Portal navigation to incorporate the amount of HSF content being added. Also, there may be more than one place to add the same content.

**Table 2: Portal Site Summary with HSF Content**

<b><i>For Media and Press</i></b>	<b>Multimedia</b>
<ul style="list-style-type: none"><li>• ISS Status Reports</li><li>• Shuttle Status Reports</li><li>• Mission Press Kits</li><li>• Fact Sheet Library</li></ul>	<ul style="list-style-type: none"><li>• Sky Watch</li><li>• Orbital Tracker</li><li>• Orbital Elements</li><li>• Weather</li><li>• Ask the Experts</li><li>• Flash Gallery</li><li>• Image Gallery</li><li>• Video Gallery</li><li>• Audio Gallery</li><li>• Mission TV Schedule</li></ul>
<b><i>News and Events</i></b>	
<ul style="list-style-type: none"><li>• ISS Status Reports</li><li>• Shuttle Status Reports</li></ul>	
<b><i>Missions</i></b>	<b><i>Humans In Space</i></b>
<ul style="list-style-type: none"><li>• Space Shuttle</li><li>• Space Station</li></ul>	<ul style="list-style-type: none"><li>• Behind the Scenes</li><li>• Living in Space</li></ul>

## 2.1 For Media and Press

The current and archived Shuttle and Station Status Reports could be placed here. Mission Press Kits for both Shuttle and Station missions would be located in this section also. Both status reports and press kits can obviously be linked to from the Missions section containing the Shuttle and Station content. Similarly, the Fact Sheet Library can be stored here, which is primarily Shuttle, Station, Historical and Space Science materials.

## **2.2 News and Events**

The current and archived Shuttle and Station Status Reports could also be placed here. They may also be linked to from here, or vice-versa.

## **2.3 Missions**

The Space Shuttle section will be placed here and will essentially maintain its current HSF navigation including Crew, Payloads, Spacewalks and Timelines. The International Space Station section would also be imported here with its HSF navigation primarily intact.

## **2.4 Multimedia**

This section would gain material from the HSF Real-time Data and Gallery sections.

To avoid adding nine more links to the Multimedia section, you could add a new link and page entitled more specifically Shuttle and Station Multimedia. Linking from that page would get you the new HSF content. The Mission TV schedule will be located in the NASA TV section.

## **2.5 Humans In Space**

The HSF Living In Space and Behind the Scenes sections will be placed here.

## **3.0 HSF to Portal Content Mapping: Level II Navigation**

Seventeen sections of HSF content will be targeted for placement inside the five noted sections on the Portal. Some of these HSF sections can be placed in more than one area in the Portal. They may also be linked to from different Portal sections.

Table 3: The 17 HSF sections imported into the Portal

- ISS Status Reports
- Shuttle Status Reports
- Mission Press Kits
- Fact Sheet Library
- Space Shuttle
- Space Station
- Behind the Scenes
- Living In Space
- Sky Watch
- Orbital Tracker
- Orbital Elements
- Weather
- Ask the Experts
- Flash Gallery
- Image Gallery
- Video Gallery
- Audio Gallery

While the HSF style will change to the Portal style, the navigation will remain primarily intact to preserve the links inside the huge amount of content. Below are the five Portal sections and a description of the related HSF content.

### 3.1 For Media and Press or News and Events

#### 3.1.1 Shuttle and Station Status Reports

The Shuttle and Station Status Reports (SRs) will retain their HSF navigation, which consists of a Main Status Reports page that links to index pages for current and past missions. Those index pages then link to the individual SRs for each mission.

#### 3.1.2 Mission Press Kits

A USA site contains the Shuttle and Station Press Kits. A link may be provided from the Portal or the press kits can be imported into the Portal. Also, Shuttle and Station Mission pages would still link to the USA site, should USA still host the Press Kits.

#### 3.1.3 Fact Sheets Library

This section is just one page that links to many HSF Fact Sheets.

Table 4: Portal Site Summary with HSF Content (level II and level III content)

For Media and Press or News and Events	Missions
ISS Status Reports	Shuttle Missions
SRs index page	Shuttle index page
Past Expeditions	Crew
Current Expeditions	Payloads
	Spacewalks
Shuttle Status Reports	Timelines
SRs index page	Upcoming Missions
Past Missions	Past Missions
Current Missions	Reference
	Mission Press Kits
Mission Press Kits	
Press Kit index page	Station Missions
Past / Current Expeditions	Station index page
Past / Current Shuttle Missions	Assembly
	Crew
Fact Sheets Library	Science
Fact Sheet index page	Spacewalks
Various HSF Fact Sheets	Timelines
	Upcoming Missions
Preparing for Space Travel	Past Missions
	Reference
Behind the Scenes	Mission Press Kits
Living in Space	<b>Multimedia</b>
Living in Space (HSF)	<i>See Table 5</i>

## 3.2 Missions

### 3.2.1 Shuttle and Station

These pages provide the latest details of a mission and preparations for upcoming missions, for example, mission clocks, imagery, etc...

#### 3.2.1.1 Crew

This page provides the crew portrait, interviews, bios, and links to imagery.

#### 3.2.1.2 Payloads and Science

The payloads page applies to the Shuttle section, since the shuttle delivers payloads to orbit and to the station. The science page applies to the Station section, since each expedition

performs newer experiments or continues with experiments carried over from previous expeditions.

#### 3.2.1.3 Spacewalks

This page provides summaries, data and statistics on upcoming spacewalks and completed spacewalks.

#### 3.2.1.4 Timelines

This page provides links to PDF documents detailing activities to occur each flight day.

#### 3.2.1.5 Upcoming Missions

This page provides summary data for each upcoming Shuttle and Station mission such as flight number, launch and land dates, payloads, etc... If more detail is available a link is provided to the Mission page for that flight.

#### 3.2.1.6 Past Missions

This page provides summary data for past Shuttle and Station missions such as flight number, launch and land dates, payloads, etc... Links are provided to the Mission pages for each flight.

#### 3.2.1.7 Reference

This page provides links to lengthy documents detailing every aspect of the Shuttle and Station program.

### **3.3 Preparing for Space Travel**

#### 3.3.1 Behind the Scenes

This section discusses the many people involved in preparing for a shuttle or station mission.

### **3.4 Living in Space**

#### 3.4.1 Living in Space (HSF)

This section provides a playful look at the many facets of living in orbit.

## 3.5 Multimedia

### 3.5.1 Image Gallery

Pre-flight, on-orbit and post-flight imagery is provided for current and past Shuttle and Station missions. Also, imagery is provided for past space flight programs.

**Table 5: Multimedia Site Summary with HSF Content (level II and level III content)**

#### ***Image Gallery***

- Shuttle index pages
  - Pre-flight
  - On-orbit
  - Post-flight
- Expedition index pages
  - See above
- Apollo index pages
  - See above
- Gemini index pages
  - See above
- Mercury index pages
  - See above
- Apollo-Soyuz index pages
  - See above
- Skylab index pages
  - See above
- Vision index pages
  - Mars Exploration
  - Lunar Exploration

#### ***Audio Gallery***

- Shuttle index pages
  - Wake-up songs
  - Ask the Expert

#### ***Flash Gallery***

- Flash Gallery index

#### ***Video Gallery***

- Shuttle index pages
  - Pre-flight
  - On-orbit
  - Post-flight
- Expedition index pages
  - See above
- Apollo index pages
  - See above
- Gemini index pages
  - See above
- Mercury index pages
  - See above
- Apollo-Soyuz index pages
  - See above
- Skylab index pages
  - See above

#### ***Interactive Features***

- Sky Watch
  - Java Applet
  - City Sightings
  - Quick Start Guide
  - Help
- Orbital Tracker
- Orbital Elements
- Ask the Expert
  - Ask MCC
  - Ask the Shuttle Crew
  - Ask the Expedition Crew
  - Current answers
  - Archived answers
- Weather
- Flash Gallery
- Mission TV Schedule

### 3.5.2 Video Gallery

Pre-flight, on-orbit and post-flight video is provided for current and past Shuttle and Station missions. Also, video is provided for past space flight programs.

### 3.5.3 Audio Gallery

Wake-up songs are provided for each Shuttle flight day. Occasionally, audio is provided from astronauts answering questions submitted by users in the Ask the Expert section

### 3.5.4 Interactive Features

This section allows HSF to include many popular features allowing users to follow the shuttle and station on-orbit and potentially interact with astronauts and MCC.

#### 3.5.4.1 Sky Watch

This section provides an applet allowing users to view an orbiting spacecraft from their backyard.

#### 3.5.4.2 Orbital Tracker

This page provides an applet showing the location of the Shuttle or Station as it orbits the world.

#### 3.5.4.3 Orbital Elements

This page provides more data helping space aficionados locate orbiting spacecraft.

#### 3.5.4.4 Ask the Expert

This page allows users to submit questions to orbiting crewmembers and MCC. Answers are posted then archived at the end of a mission. There may be technical issues with migrating this content.

#### 3.5.4.5 Weather

This page provides links to unofficial and official weather bureaus to show weather conditions for launches and landings.

#### 3.5.4.6 Flash Gallery

HSF flash animations could be stored here.

#### 3.5.4.7 Mission TV Schedule

This page provides an up-to-date TV Schedule of mission events and will be located in the NASA TV section.

## EXAMPLE 2 - SpaceLink - Web Preliminary Designs for Global Navigation Areas in For Educators

Discussion of what will be moved from SpaceLink.

**Classroom Subjects** - An evolution of the Curriculum Support section of Spacelink. It contains links to the best online sites NASA has for 73 subject areas. The approach is not to link to everything related to a subject and overwhelm the educators but to filter it down to what fits the subject best.

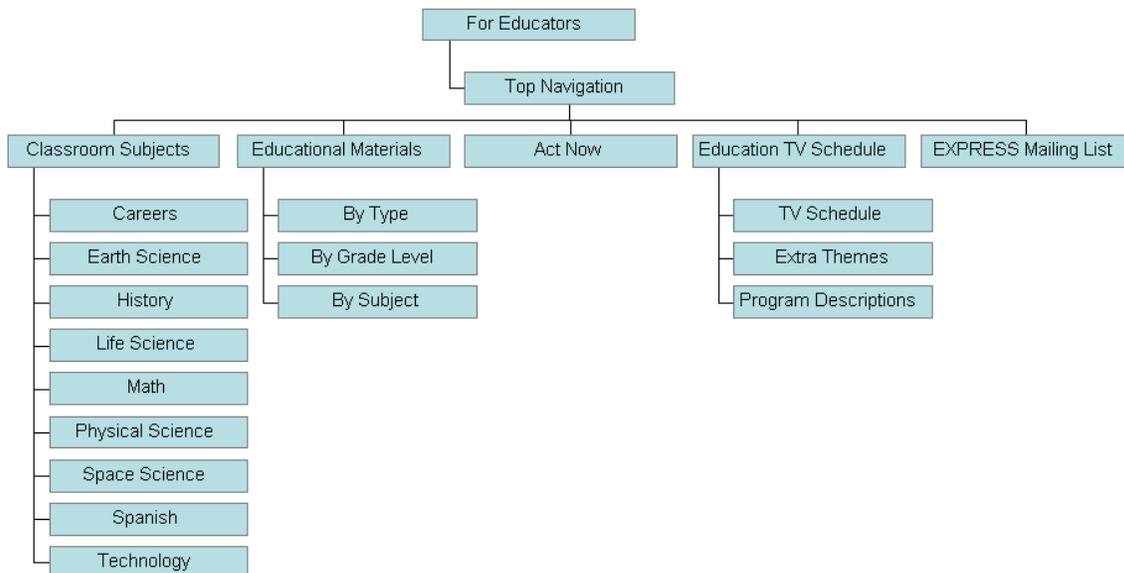
**Educational Materials** - The Educational Products area from Spacelink but now with the ability to see listings by subject, grade level, or type product. It contains 48 products vs. 209 on Spacelink due to accessibility restrictions.

**Act Now** - The Act Now Before it Goes Away section of Spacelink. Highlights dated opportunities in central location. Some of these may also be features but this is a way of keeping them highlighted once the feature rolls into the archive.

**Education TV Schedule** - The Education Schedule, Program Descriptions, and Spacelink Extra sections of Spacelink combined together.

**EXPRESS Mailing List** - The Spacelink EXPRESS mailing list is now NASA's EXPRESS Mailing List for Educators. We will send a message to our 5,071 subscribers informing them of the change. This is much more visible now which should result in increased subscriptions.

Proposed Extensions to IA.



## APPENDIX C

### Additional Sites for Analysis

The following sites will be analyzed and reports will be delivered to NASA HQ regarding the costs and complexities of importing each site, but the actual import of these sites is not included in this estimate:

1. Liftoff to Learning <http://liftoff.msfc.nasa.gov>
2. Spaceflight <http://spaceflight.nasa.gov>
3. NASA Kids <http://kids.msfc.nasa.gov> (already completed by Education)
4. NASA Spacelink <http://spacelink.nasa.gov> (in progress by Education)
5. Mars Exploration <http://mars.jpl.nasa.gov>
6. Earth Observatory <http://earthobservatory.nasa.gov>
7. NASA History Office <http://history.nasa.gov> (included in Portal base task plan)
8. Astrobiology HP <http://astrobiology.arc.nasa.gov/>
9. NASA Image Exchange <http://nix.nasa.gov/>
10. NASA Jobs <http://www.nasajobs.nasa.gov/>
11. Goddard FOIA <http://genesis.gsfc.nasa.gov/foia/gsfccoia.htm>
12. KSC FOIA <http://www-pao.ksc.nasa.gov/foia/foia.htm>
13. LaRC FOIA <http://foia.larc.nasa.gov/>
14. MSFC FOIA <http://www.msfc.nasa.gov/FOIA/>
15. Greatest Images of NASA <http://grin.hq.nasa.gov/>
16. NASA Technology Portal <http://nasatechnology.nasa.gov/index.cfm>
17. Solar System <http://solarsystem.nasa.gov/>
18. Solar System Simulator <http://space.jpl.nasa.gov/>
19. Planetary Photo journal <http://photojournal.jpl.nasa.gov/>
20. Topex/Poseidon <http://topex-www.jpl.nasa.gov/>
21. Cassini <http://saturn.jpl.nasa.gov/index.cfm>
22. Stardust <http://stardust.jpl.nasa.gov/>
23. SeaWinds <http://winds.jpl.nasa.gov/missions/quikscat/quikindex.html>
24. Genesis <http://genesismission.jpl.nasa.gov/>
25. Ocean Surface from Space <http://sealevel.jpl.nasa.gov/>
26. Voyager <http://voyager.jpl.nasa.gov/>
27. Origins <http://origins.jpl.nasa.gov/>
28. Near-Earth Object Program <http://neo.jpl.nasa.gov/>
29. Planet Quest <http://planetquest.jpl.nasa.gov/>
30. Terra <http://terra.nasa.gov/>
31. Aqua <http://eos-pm.gsfc.nasa.gov/>
32. TRMM <http://trmm.gsfc.nasa.gov/>
33. TOMS <http://jwocky.gsfc.nasa.gov/>
34. TIMED <http://stp.gsfc.nasa.gov/missions/timed/timed.htm>
35. Asteroid and Comet Impact <http://impact.arc.nasa.gov/>
36. Space Transportation <http://www.spacetransportation.com/>
37. Earth Science Missions [http://gaia.hq.nasa.gov/ese\\_missions/lau\\_select.cfm](http://gaia.hq.nasa.gov/ese_missions/lau_select.cfm)
38. Space Science Missions <http://spacescience.nasa.gov/missions/index.htm>

SEE CONTINUED LIST BELOW

Additional sites that need to be included to create such overall savings are

- Public affairs sponsored sites
- Center sites
- Mission office (previously Enterprise) sites
- Project and program sites
- Outreach sites
- Other content that is directed to the general public but may be part of another site. This includes content on non-nasa.gov sites but for which the work is funded by NASA. (For example, if public outreach information on a NASA-funded task is hosted on a [www.xyz.edu](http://www.xyz.edu) site, that information must also be provided to the NASA Portal.)

Beyond the initial inclusion of such sites, content needs to be integrated so that material on a particular subject can be found in one location. An example of this is the Portal's Cassini mission site, <http://www.nasa.gov/cassini>. Top-level content is material for the general public, but links to more technically sophisticated content are readily apparent.

Some NASA sites, including those identified in this plan, present content that is meant for the public but also restricted content that is meant for NASA employees and contractors. This restricted content will also need to be migrated or linked to from the InsideNASA Portal, as appropriate.

Additional sites are continued below. Note that the intention is to migrate as much content as possible. While the 170 sites have been referenced in the plan, the total number of sites may be greater than 170.

#### ADDITIONAL SITES

- |                                |                                   |
|--------------------------------|-----------------------------------|
| 39. polar.gsfc.nasa.gov        | 58. www-mipl.jpl.nasa.gov         |
| 40. quest.arc.nasa.gov         | 59. tartarus.gsfc.nasa.gov        |
| 41. guinan.gsfc.nasa.gov       | 60. curator.jsc.nasa.gov          |
| 42. www.msfc.nasa.gov/news/    | 61. nssdc.gsfc.nasa.gov           |
| 43. www.nas.nasa.gov           | 62. starchild.gsfc.nasa.gov       |
| 44. nepp.nasa.gov              | 63. lena.gsfc.nasa.gov            |
| 45. ltpwww.gsfc.nasa.gov       | 64. www.grc.nasa.gov/Doc/news.htm |
| 46. visibleearth.nasa.gov      | 65. si.ksc.nasa.gov               |
| 47. cmex.arc.nasa.gov          | 66. ilrs.gsfc.nasa.gov            |
| 48. acdisx.gsfc.nasa.gov       | 67. mpfwww.jpl.nasa.gov           |
| 49. microgravity.grc.nasa.gov  | 68. observe.arc.nasa.gov          |
| 50. apod.gsfc.nasa.gov         | 69. research.hq.nasa.gov          |
| 51. human-factors.arc.nasa.gov | 70. dsnr2.jpl.nasa.gov            |
| 52. ethics-www.jpl.nasa.gov    | 71. ssdoo.gsfc.nasa.gov           |
| 53. modis-atmos.gsfc.nasa.gov  | 72. daac.gsfc.nasa.gov            |
| 54. asd-www.larc.nasa.gov      | 73. sunearth.gsfc.nasa.gov        |
| 55. science.ksc.nasa.gov       | 74. mas.arc.nasa.gov              |
| 56. imagine.gsfc.nasa.gov      | 75. msp.gsfc.nasa.gov             |
| 57. www-aig.jpl.nasa.gov       | 76. ct.gsfc.nasa.gov              |

77. trs.nis.nasa.gov  
78. ohr.gsfc.nasa.gov  
79. mls.jpl.nasa.gov  
80. facilities.grc.nasa.gov  
81. sgra.jpl.nasa.gov  
82. spso.gsfc.nasa.gov  
83. eosps0.gsfc.nasa.gov  
84. seawifs.gsfc.nasa.gov  
85. www-lite.larc.nasa.gov  
86. nctn.hq.nasa.gov  
87. southport.jpl.nasa.gov  
88. whyfiles.larc.nasa.gov  
89. setas-www.larc.nasa.gov  
90. space.gsfc.nasa.gov  
91. vision.arc.nasa.gov  
92. cs.jpl.nasa.gov  
93. techreports.larc.nasa.gov  
94. lis.gsfc.nasa.gov  
95. library01.gsfc.nasa.gov  
96. lunar.arc.nasa.gov  
97. www-curator.jsc.nasa.gov  
98. code916.gsfc.nasa.gov  
99. angler.larc.nasa.gov  
100. asapdata.arc.nasa.gov  
101. appl.nasa.gov  
102. batse.msfc.nasa.gov  
103. grcpublishing.grc.nasa.gov  
104. snowdog.larc.nasa.gov  
105. gpmscience.gsfc.nasa.gov  
106. oodt.jpl.nasa.gov  
107. pds.jpl.nasa.gov  
108. aerospacescholars.jsc.nasa.gov  
109. nesb.larc.nasa.gov  
110. eo.arc.nasa.gov  
111. shemesh.larc.nasa.gov  
112. people.nas.nasa.gov  
113. technology.jpl.nasa.gov  
114. passport.arc.nasa.gov  
115. geo.arc.nasa.gov  
116. lsda.jsc.nasa.gov  
117. vathena.arc.nasa.gov  
118. sdcd.gsfc.nasa.gov  
119. magaxpl.msfc.nasa.gov  
120. wwwghcc.msfc.nasa.gov  
121. academy.gsfc.nasa.gov  
122. leonids.hq.nasa.gov  
123. glast.gsfc.nasa.gov  
124. sofia.arc.nasa.gov  
125. nodis3.gsfc.nasa.gov  
126. cosssc.gsfc.nasa.gov  
127. aps.arc.nasa.gov  
128. ldaps.arc.nasa.gov  
129. ossim.hq.nasa.gov  
130. acquisition.jpl.nasa.gov  
131. images.jsc.nasa.gov  
132. wwwastro.msfc.nasa.gov  
133. mdob.larc.nasa.gov  
134. www-spof.gsfc.nasa.gov  
135. ringmaster.arc.nasa.gov  
136. ase.arc.nasa.gov  
137. denali.gsfc.nasa.gov  
138. earthsciences.gsfc.nasa.gov  
139. marsweb.jpl.nasa.gov  
140. ww1.wff.nasa.gov  
141. thunder.nsstc.nasa.gov  
142. landsat.gsfc.nasa.gov  
143. ranier.oact.hq.nasa.gov  
144. icb.nasa.gov  
145. neurolab.jsc.nasa.gov  
146. ivanova.gsfc.nasa.gov  
147. podaac.jpl.nasa.gov  
148. eosdata.gsfc.nasa.gov  
149. zerog.jsc.nasa.gov  
150. icebox-esn.grc.nasa.gov  
151. www.ghcc.msfc.nasa.gov  
152. core2.gsfc.nasa.gov  
153. virtualeskies.arc.nasa.gov  
154. tmo.jpl.nasa.gov  
155. asrs.arc.nasa.gov  
156. rapweb.jpl.nasa.gov  
157. popo.jpl.nasa.gov  
158. dsnr.jpl.nasa.gov  
159. bulletin.ksc.nasa.gov  
160. www-misr.jpl.nasa.gov  
161. ares.jsc.nasa.gov  
162. galileo.jpl.nasa.gov  
163. amsd-www.larc.nasa.gov  
164. stp.msfc.nasa.gov  
165. astp.msfc.nasa.gov  
166. library.gsfc.nasa.gov  
167. cism.jpl.nasa.gov  
168. adc.gsfc.nasa.gov

- 169. eo1.gsfc.nasa.gov
- 170. rst.gsfc.nasa.gov
- 171. nkma.ksc.nasa.gov
- 172. globalchange.nasa.gov
- 173. nmsp.gsfc.nasa.gov
- 174. mgs-mager.gsfc.nasa.gov
- 175. asas.gsfc.nasa.gov
- 176. sunland.gsfc.nasa.gov
- 177. nmp.jpl.nasa.gov
- 178. rotores.arc.nasa.gov
- 179. outsource.gsfc.nasa.gov
- 180. n1517311.ksc.nasa.gov
- 181. coolspace.gsfc.nasa.gov
- 182. history.msfc.nasa.gov
- 183. centauri.larc.nasa.gov
- 184. sel.gsfc.nasa.gov
- 185. funphysics.jpl.nasa.gov
- 186. ipb.gsfc.nasa.gov
- 187. imagers.gsfc.nasa.gov
- 188. jau.jpl.nasa.gov
- 189. digitalearth.gsfc.nasa.gov
- 190. oceantopo.jpl.nasa.gov
- 191. techtran.msfc.nasa.gov
- 192. oea.larc.nasa.gov
- 193. svgs.gsfc.nasa.gov
- 194. asterweb.jpl.nasa.gov
- 195. lennier.gsfc.nasa.gov
- 196. antwrp.gsfc.nasa.gov
- 197. nvo.gsfc.nasa.gov
- 198. pat.jpl.nasa.gov
- 199. wright.nasa.gov
- 200. microgravity.msfc.nasa.gov
- 201. lhea-glast.gsfc.nasa.gov
- 202. maps.gsfc.nasa.gov
- 203. rsif.wff.nasa.gov
- 204. deepimpact.jpl.nasa.gov
- 205. ohr.larc.nasa.gov
- 206. hrd.msfc.nasa.gov
- 207. mtp.jpl.nasa.gov
- 208. leonid.arc.nasa.gov
- 209. standards.gsfc.nasa.gov
- 210. weather.msfc.nasa.gov
- 211. nasajobs.nasa.gov
- 212. swsi.gsfc.nasa.gov
- 213. lheawww.gsfc.nasa.gov
- 214. topweb.gsfc.nasa.gov
- 215. pwg.gsfc.nasa.gov
- 216. parts.jpl.nasa.gov
- 217. rushmore.jpl.nasa.gov
- 218. www-gte.larc.nasa.gov
- 219. see.msfc.nasa.gov
- 220. sspp.gsfc.nasa.gov
- 221. ldms.larc.nasa.gov
- 222. hrf.jsc.nasa.gov
- 223. jwst.gsfc.nasa.gov
- 224. gsfc-aphrodite.gsfc.nasa.gov
- 225. www-psao.grc.nasa.gov
- 226. femci.gsfc.nasa.gov
- 227. environmental.ksc.nasa.gov
- 228. aol.wff.nasa.gov
- 229. corn.eos.nasa.gov
- 230. researchpark.arc.nasa.gov
- 231. lifesci.arc.nasa.gov
- 232. lshp.gsfc.nasa.gov
- 233. osat-ext.grc.nasa.gov
- 234. www.ipg.nasa.gov
- 235. msl.jpl.nasa.gov
- 236. enso.larc.nasa.gov
- 237. academy.arc.nasa.gov

## **Appendix D**

### **Simple Example of Integration Effort**

Since the tasks required to migrate content do not vary much, the difference in effort required by the outsourced contractor actually must be offset by the individual site sponsors' own resources who are performing these tasks in lieu of the contractor. So from the global agency's perspective, the total cost of integration is the sum of the outsourced contractors efforts estimated here, plus the incremental cost of the site sponsors' personnel who take on specific tasks instead of the contractor.

A simplified example of this is two cases for migrating a site containing 100 HTML pages and 500 total assets.

In Case 1, the outsourced contractor is handed a copy of the site and is asked to complete all the tasks associated with migrating it as a Level 1 integration into the CMS. The contractor would:

1. Inventory the site content.
2. Have their own NASA content experts determine where in the existing Portal IA the content should be located.
3. Analyze the existing HTML to determine how best to isolate the true content on each page.
4. Based on the above, mark the actual page content to indicate where it will finally reside in the Portal CMS.
5. Either use scripts or manually migrate the page-level content into the CMS.
6. Either manually or with scripts migrate all the associated assets into the CMS.
7. Either manually or with scripts, resolve the new links to the associated assets from the migrated pages.
8. Based on what is appropriate for the new location in the CMS, modify or create new presentation templates for the content.
9. Create, identify and/or prepare new label images and banners to be used on the modified templates.
10. Add appropriate promotional information to the assets to allow for the creation of collection links for navigation to the content.
11. Create the index pages required to associate the promotional information described above.
12. Apply any additional or, in many cases, basic metadata to the content.
13. Publish the content into a staging area where Q/A can be performed, and make any QA revisions and republish/retest.
14. Perform 508 compliance checks on content in staging and make any 508 revisions needed and republish/retest.
15. Create or integrate the site sponsor's required ongoing workflow for creating new content.
16. Publish the migrated site to production.
17. Create or modify existing metric log analyses to include the new content if necessary.

In Case 2 of our simplified example, the site sponsor could choose to do all integration tasks themselves and only involve the contractor for integration guidance and perhaps minor template modification.

In both cases the integration tasks remain the same. However, the costs estimated in this plan would go from a large cost in case 1, to a much smaller cost in case 2.

In reality the actual process of integration is much more complex. The contractor generally is involved to a lesser or greater extent than the extremes of Case 1 and Case 2 in this example.